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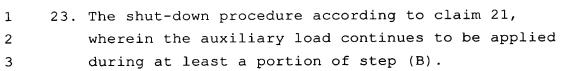
## CLAIMS

What is claimed is:

- 1 A procedure for shutting down an operating fuel cell system, wherein, during operation of the fuel 2 cell system, a continuous flow of air is being 3 provided to a fuel cell cathode from an oxidant 4 source through a cathode flow field on one side of 5 an electrolyte, and a continuous flow of fresh 6 hydrogen containing fuel is being provided to a 7 8 fuel cell anode from a fuel source through an anode flow field on the other side of the electrolyte, 9 10 and an electric current is being generated by the fuel cell within an external circuit and is 11 operating a primary electricity using device in the 12 external circuit, the procedure including the 13 following steps: 14
  - (A) disconnecting the primary electricity using device from the external circuit and stopping the flow of fresh fuel from the fuel source to the anode flow field; and, then
  - (B) displacing the fuel remaining within the anode flow field with air by blowing air into and through the anode flow field while venting the anode flow field exhaust.
  - The shut down procedure according to claim 1,
     wherein after step (A) and before step (B),
     connecting an auxiliary resistive load for a period of time across the anode and cathode in an external circuit.
  - The shut-down procedure according to claim 2,
     wherein the auxiliary load is applied until the
     cell voltage is reduced to about 0.2 volts or less.
  - 1 4. The shut-down procedure according to claim 2,
    2 wherein the auxiliary load is applied until the
    3 cell voltage is reduced by 0.1 volt or more prior
    4 before step (B).

- 1 5. The shut-down procedure according to claim 2,
  2 wherein the size of the applied auxiliary load is
  3 selected to reduce the cell voltage to about 0.2
  4 volts or less in less than 1.0 minute.
- 1 6. The shut-down procedure according to claim 5,
  2 wherein the auxiliary load continues to be applied
  3 during step B.
- 7. The shut-down procedure according to claim 2, wherein during the application of the auxiliary load a flow of air is maintained through the cathode flow field.
- 1 8. The shut-down procedure according to claim 1,
  2 wherein the step of displacing the fuel comprises
  3 moving a front of air through the anode flow field
  4 in less than 1.0 second.
- 9. The shut-down procedure according to claim 8, wherein the front of air moves through the anode flow field in less than 0.2 seconds.
- 1 10. The shut-down procedure according to claim 9,
  2 wherein the front of air moves through the anode
  3 flow field in less than 0.05 seconds.
- 1 11. The shut-down procedure according to claim 9,
  2 wherein the flow of air to the cathode flow field
  3 is stopped during the time the said front of air is
  4 moving through the anode flow field.
- 1 12. The shut-down procedure according to claim 2,
  2 wherein the step of displacing the fuel comprises
  3 moving a front of air through the anode flow field
  4 in less than 1.0 second.
- 1 13. The shut-down procedure according to claim 12, wherein the air front moves through the anode flow field in less than 0.2 seconds.
- 1 14. The shut-down procedure according to claim 12, 2 wherein the air front moves through the anode flow 3 field in less than 0.05 seconds.

- 15. The shut-down procedure according to claim 1, 1 wherein, during normal fuel cell operation under 2 load, a recycle blower within a recycle loop 3 4 recirculates at least a portion of the anode flow field exhaust through the anode flow field; and 5 wherein in step (B) the air is blown into and 6 through the anode flow field using the recycle 7 blower and without recirculating the anode exhaust. 8
- 1 16. The shut down procedure according to claim 15,
  2 wherein after step (A) and before step (B),
  3 connecting an auxiliary resistive load across the
  4 anode and cathode in an external circuit.
- 1 17. The shut-down procedure according to claim 16,
  2 wherein the step of displacing the fuel comprises
  3 moving a front of air through the anode flow field
  4 in less than 1.0 seconds.
- 1 18. The shut-down procedure according to claim 16,
  2 wherein the step of displacing the fuel comprises
  3 moving a front of air through the anode flow field
  4 in less than 0.2 seconds.
- 1 19. The shut-down procedure according to claim 18,
  2 wherein the step of displacing the fuel comprises
  3 moving a front of air through the anode flow field
  4 in less than 0.05 seconds.
- 20. The shut-down procedure according to claim 19, wherein the auxiliary load is applied until the cell voltage is reduced to about 0.2 volts or less.
- 1 21. The shut-down procedure according to claim 17,
  2 wherein the auxiliary load is applied until the
  3 cell voltage is reduced by at least 0.1 volt before
  4 step (B).
- 1 22. The shut-down procedure according to claim 20, 2 wherein the auxiliary load continues to be applied 3 during at least a portion of step (B).



1	24.	The shut-down procedure according to claim 20,
2		wherein the auxiliary load continues to be applied
3		during step B until all the fuel has been displaced